

Climatological Data for September, 1910.
DISTRICT No. 11, CALIFORNIA.

Prof. ALEXANDER G. McADIE, District Editor.

GENERAL SUMMARY.

September in this district was somewhat cooler than the average. There was more rain than normally falls in September, the month, as a rule, being one of light precipitation, still at a large number of stations there was no precipitation during the month. There was a period of unsettled weather in many sections on the 13th, 14th, and 15th, and in the southern counties showers occurred also on the 30th, the precipitation being light however, except in the mountains.

There were no special features of importance in the general character of the weather for the month. There was a succession of pleasant days with moderate temperatures on the coast, and no extremely high temperatures in the interior from the 1st until the 13th. The morning reports of September 10 indicated the existence of a kona storm over the Hawaiian Islands; and the pressure distribution over the United States was such that the possibility of a northward extension of the subtropical rain belt suggested itself to the forecaster. On the night of September 13 rain was imminent in the extreme southern counties of California, and thunderstorms were reported throughout the Valley of the Colorado with strong southerly winds. Northerly winds with a rainfall of 1.22 inch occurred at Yuma, Ariz., and 1.94 inch fell at Campo, Cal. Rain began at Blythe, Cal., on the 12th, and continued until the 14th.

The rain area slowly extended northward across the Sierra Madre, and on September 14 heavy showers occurred throughout the San Joaquin Valley, the Sierra Nevada, Owens Valley, and eastward through the Great Basin. There was but little change in pressure distribution. While the disturbance originated in the south and moved northward, there was practically no rain at Los Angeles and San Diego; but heavy rain fell along the coast between Point Hueneme and Point Conception. At Santa Barbara, on the 15th, 2.36 inches fell and at Pine Crest 2.54 inches. The rainfall at Ventura, or rather in the whole bean section, did considerable damage to beans. In the raisin section of the San Joaquin considerable damage was done, as the grapes were on the trays and conditions were not favorable for stacking. The total rainfall at Fresno up to 8 a. m. of September 15 was 1.00 inch, making the largest seasonal rainfall to date during the past 23 years. This early rain is described in detail elsewhere in the report from this section.

That portion of the month between the 16th and 19th was one of unsettled weather, with considerable cloudiness in the morning hours and at night, but fair weather during the day. From the 20th to the 30th normal conditions existed, except in the counties south of the Tehachapi, where at the close of the month thunderstorms occurred.

The month was without any warm spells, particularly high temperatures with strong north winds. In the desert sections some high temperatures were recorded, notably 119° on the 3d at Mammoth Tank, and 116° at Indio on the 9th, and 115° at Blythe on the same date. Last year during September the highest temperature recorded in this section was 108°.

The prevailing winds in the southern counties were from the south; but in the coast counties they were from the west. There was considerable fog along the coast during the morning hours.

TEMPERATURE.

Comparing the present month with previous years it appears that the mean temperature of the State, while nearly a degree cooler than the mean for the past 14 years, was warmer than September, 1907. September, 1908, and September, 1909, had practically normal temperatures.

Year.	Mean.	Departure.	Year.	Mean.	Departure.
	° F.	° F.		° F.	° F.
1897.....	67.7	-0.5	1904.....	70.3	+2.1
1898.....	69.2	+1.0	1905.....	68.6	+0.4
1899.....	70.9	+2.7	1906.....	68.6	+0.4
1900.....	65.4	-2.8	1907.....	65.6	-2.6
1901.....	66.0	-2.2	1908.....	68.1	-0.1
1902.....	70.1	+2.5	1909.....	68.2	0.0
1903.....	68.7	+0.5	1910.....	67.3	-0.9

The highest temperature recorded was 119° on the 3d, at Mammoth Tank; and the lowest 20°, which occurred at three places on different dates, namely, Quincy on the 1st, Macdoel on the 12th, and Alturas on the 14th. The highest mean temperature was 93° at Mammoth Tank and the lowest mean, 42.2° at Hornbrook.

PRECIPITATION.

The precipitation was greater than during any September during the past 5 years. The following table gives the average precipitation:

Year.	Amount.	Departure.	Year.	Amount.	Departure.
	Inch.	Inch.		Inch.	Inch.
1897.....	0.03	-0.46	1904.....	2.66	+2.17
1898.....	0.64	+0.15	1905.....	0.16	-0.33
1899.....	0.03	-0.46	1906.....	0.25	-0.24
1900.....	0.22	-0.27	1907.....	0.13	-0.36
1901.....	0.64	+0.35	1908.....	0.49	0.00
1902.....	0.01	-0.48	1909.....	0.52	+0.03
1903.....	0.10	-0.39	1910.....	0.69	+0.20

The greatest monthly precipitation was at Ozena, Ventura County, 4.15 inches, and there were other heavy rainfalls throughout Ventura and Santa Barbara counties. The rainfalls were also unusually heavy and unusually early in Fresno, Kings, Tulare, and Kern counties. There were a number of stations reporting 1.00 inch of rain or more on September 15. The greatest 24-hour rainfall was 4.10 inches, which occurred in the Ojai Valley September 14-15. Many stations reported no precipitation during the month.

SUNSHINE.

The following table gives the hours of sunshine and the percentage of possible:

Stations.	Hours.	Per cent of possible.	Stations.	Hours.	Per cent of possible.
Eureka.....	132	35	San Diego.....	268	72
Fresno.....	338	81	San Francisco.....	251	67
Los Angeles.....	282	76	San Jose.....	290	78
Mount Tamalpais.....	346	93	Alturas.....		83
Red Bluff.....	326	87	Santa Barbara.....		74
Sacramento.....	343	92	Santa Cruz.....	205	

NOTES ON THE RIVERS OF THE SACRAMENTO AND SAN JOAQUIN WATERSHEDS DURING THE MONTH OF SEPTEMBER, 1910.

By N. R. TAYLOR, Local Forecaster.

Sacramento watershed.—There was little change in the Sacramento River north of Red Bluff during the month; the river at that point averaged 1.0 foot, which is the same as that recorded during the month preceding, and 0.4 foot above the low water of 1908.

There was also a slight rise between Red Bluff and Colusa, while south of Colusa, and especially between that station and Knights Landing, there was a rise between the 15th and 19th. At Knights Landing the average stage was -0.1 foot, the lowest of which there is a record.

By the close of the month the river at most points had receded to the low stages that prevailed previous to the rains and was either stationary or falling slowly from the mouth of the Pitt River to Collinsville.

Heavy rains in the headwaters of the Feather-Yuba from the 14th to 16th resulted in marked rises in all of the smaller streams throughout this territory, but, with the exception of the Yuba at Marysville, where there was a rise of slightly over 1 foot, little effect of the rains was noted in the main streams.

The American River averaged somewhat higher than during the preceding month.

San Joaquin watershed.—Rain fell generally throughout the drainage basin of the San Joaquin River from the 14th to 16th, and all the tributaries responded thereto. At most points the river, prior to the rains, reached the lowest levels ever recorded, notably, the Stanislaus at Melones, where it fell to over 4 feet below the zero gage, and where an average of nearly 4 feet below was maintained.

The San Joaquin itself responded quickly to the rainfall at all points along its course, with a rise of over 3 feet at Pollasky and Firebaugh, and of 2 feet at Lathrop, but it receded rapidly during the last decade of the month, and its general average was as low or lower than that of the month preceding.

EARLY RAIN AT FRESNO, CAL., IN SEPTEMBER.

By W. E. BONNETT, Local Forecaster.

No feature of the meteorological record for the month needs particular remark except the unusual rains of the 14th and 15th. The extremes of temperature, 102° on the 1st and 48° on the 13th, are well within the limits established from 23 years of record. The rains here mentioned are remarkable for their amount and for the early date upon which they occurred. A fall of 0.27 inch occurred during the forenoon of the 14th, this being greater than any shower to that date since the beginning of the Weather Bureau record at Fresno. A further fall of 0.73 inch occurred on the 15th, and the weather remained threatening during the 16th with a light shower in the early morning hours.

Warnings of rain were issued on the evening of the 13th, and the work of stacking the raisin trays went on in the vineyards during the entire night. Practically all picking had been done, but the work had been finished so recently before the rains that much labor imported into the vineyards for picking the crop was still available for the business of stacking trays. The inconvenience of night work can well be imagined and the difficulty of securing assistance for stacking in the nighttime hours is very great for those who do not have the necessary help permanently employed. The night of the 13th was partly cloudy to cloudy so that the moon, although nearly full, lent but feeble aid to the workers. Furthermore, the quantity of the product to be thus speedily handled was very great, and a part of the crop was found unprotected when the rains came. It is impossible even at the close of the month to obtain a fair estimate of the damage, but the loss will probably not be very great. In no case that has come to my notice has it been necessary to dispose of the raisin grapes, that were wet, to the wineries as sometimes happens. All will be saved as raisins. The damage consists in a somewhat poorer quality of the product, an inferiority due principally to a less salable appearance rather than to any real inferiority in quality. The fact that the rains were so early will probably account in great part for this comparatively small damage, as the raisins were in the earlier stages of the drying process, many not having been turned. However, the rains are having the important effect of prolonging the drying season and a great proportion of the crop remains on the trays at the close of the month. The ground was thoroughly wet and dew formed almost nightly, a meteorological phenomenon that is rare for September under normal conditions at this

place. Drying, therefore, ceases during the night and it is proceeding slowly during the day under this condition of increased humidity. In a lengthened drying season, the cost of production may be greatly increased, owing to the possible need for repeated stacking and unstacking of the trays with the approach of the rainy season.

CONSERVATION OF THE PURITY OF THE AIR—PREVENTION OF SMOKE.

By ALEXANDER G. McADIE.

Some interesting questions arise in connection with the present use (also the proposals to use on a much larger scale) of electrical agencies for smoke prevention in cities on the Pacific coast, and especially near San Francisco. In the July report of this section reference was made to the methods used for removing the poisonous gases in smelter fumes. The need in this case was urgent, and Doctor Cottrell and those working with him have made it possible for smelters to carry on work near a large city. The irritating gases, especially the sulphur and arsenic compounds, are deposited; but it is our understanding that the carbon products are allowed to pass out into the air.

Beyond the individual problem of protecting the community from the effect of smelter smoke, there looms the much greater problem of the general purification of the air near the ground. It comes home with force to every one who must live near an industrial center that a smokeless atmosphere is a great privilege. In some communities steps have been taken to bring this about, either by improving the methods of combustion or by the use of smoke filters.

Another important matter is that of producing and maintaining dust-free atmospheres where there is special need for the same, as in hospitals, schools, auditoriums, etc. Eventually we must deal with the problem of depositing, not only the dust and nuclei of condensation, but the condensed vapor in the air also. This will lead in time to problems connected with the dissipation of fog at terminal points or in harbors, and ultimately the problem of fog control may be attacked.

In California oil is coming into widespread use and one would naturally think that, with modern methods of combustion, there would be less smoke; but such is not found to be the case. Oil is now being used not only as fuel, but in the making of gas. There is some reason for believing that, with the introduction of certain improvements, gas-house chimneys, which have always been conspicuous offenders in the pollution of the air over cities, may cease to be such. That is to say, it is proposed to practically utilize the carbon recovered in the manufacture of gas from crude oil.

Where oil is used for fuel, the gas products are carbon dioxide, carbon monoxide, and nitrogen. The smoke particles are hydrocarbons, volatile at comparatively low temperatures. In most furnaces the flame is to some degree extinguished by impinging on a comparatively cold surface. The load of carbon dust therefore passes out unconsumed. In a properly-constructed furnace all the fuel should burn and nothing pass out as black smoke. The following paragraph from an editorial in the leading power journal of the Pacific coast is worth quoting in connection with the discussion to be given later, because it not only calls attention to the mischievous effects of imperfect combustion, but shows how the fuel bill can be reduced:

Smoke is a nuisance in the eyes of the law and any reasonable ordinance intended for its abatement will be sustained by the courts. When the dirt that it creates and the discomfort that it causes become intolerable, the sufferers appeal to the lawyer for relief, and drastic legislation sometimes ensues. This may be obviated by a little care and foresight on the part of the stationary engineers, if they will but anticipate this inevitable effort for civic betterment, by drafting and urging reasonable legislation. In other words, they should not leave to lawyers and politicians the regulation and even operation of their power plants. * * * If half the time expended in trying to outwit the inspector were utilized in legitimate smoke prevention, the fuel bill at least would be the gainer.—*Journal of Electrical Power and Gas*. Vol. 25, No. 2, page 34.